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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,311	07/02/2003	Louis Robert Litwin	PU030155	4084

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EXAMINER
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PERILLA, JASON M

ART UNIT	PAPER NUMBER
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2611

DATE MAILED: 12/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/612,311

Applicant(s)

LITWIN ET AL.

Examiner

Jason M. Perilla

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 1-20 are pending in the instant application.

#### ***Response to Arguments***

2. Applicant's arguments filed October 2, 2006 have been fully considered but they are not persuasive.

The Applicant argues that the absolute value magnitude squared blocks (fig. 5, refs. 540) of Sourour et al (U.S. Pat. No. 6421371; "Sourour") are not equivalent to the absolute value blocks as claimed in the instant application. However, as broadly as claimed, Sourour does disclose "absolute value" blocks. Sourour discloses "**magnitude**-squared" (col. 7, lines 18-19) or absolute value squared blocks. Therefore, Sourour discloses at least the broadly claimed absolute value function because the functional block 540 acts upon the magnitude or absolute value of the correlated output. Furthermore, the additional square function of Sourour's block 540 does not negate the fact that it determines or acts upon the absolute value of the correlated output. Similarly, the use of magnitude or absolute value squared functions is well known in the art. See Kojima (U.S. Pat. No. 5579338) figure 5, references 40, 42, and 44; col. 6, line 59 – "square *absolute value* circuits".

Finally, as presently claimed, the linear relation is embodied by Sourour et al as the "circuitry that combines". That is, the adding circuitry creates a "linear relation of the absolute values . . . to perform pilot synchronization".

#### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-20 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding independent claims 1, 9, and 16, one skilled in the art is unable to determine the value of a "large" frequency offset. The "size" of a frequency offset is relative in the field of engineering and depends upon the design constraints of and accuracy desired in the field. One is unable to determine how the limitation of a "large" frequency should be interpreted against the prior art.

Claims 2-8, 10-15, and 17-20 are rejected as being based upon a rejected parent claim.

5. Claims 1-20 are rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential cooperative relationships of elements or steps, such omission amounting to a gap between the necessary structural connections or steps. See MPEP § 2172.01.

Regarding independent claims 1, 9, and 16, the limitation including "in the presence of a large frequency offset" is lacking operational relationship in the claim. That is, "frequency offset" plays no relation to any of the structure of the claimed apparatus or the steps of the claimed method. Therefore, one is unable to determine how "the presence" of a frequency offset would modify, inhibit the operation of, interact with, or affect the operation of the claimed invention. In essence, one skilled in the art is unable to determine how "the presence of a large frequency offset" modifies the claims.

Claims 2-8, 10-15, and 17-20 are rejected as being based upon a rejected parent claim.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3, 6, 16, 17, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sourour et al (US 6421371; hereafter "Sourour").

Regarding claim 1, Sourour discloses according to figure 5 an apparatus for performing a synchronization operation in a wireless communication system, the apparatus comprising: a plurality of sliding correlators (424) that each receives a portion of a received correlation sequence (423) and provides a partial correlation output (530-2, 530-1); a plurality of magnitude squared blocks (540-2, 540-1) that take the absolute value of each partial correlation output; and circuitry that combines (550) the absolute values of each of the partial correlation outputs to form a correlation output (col. 6, line 60 – col. 7, line 30); wherein the combining circuitry (550) creates a linear relation of the absolute values for each partial correlation which is used to perform pilot synchronization (col. 3, lines 30-45 and 50-56). In figure 5 of Sourour, the delay line of the sliding correlator (424) is divided to create a plurality of sliding correlators according to the nature of the summation of its outputs. That is, each of the delay line segment latches (D latches), their respective multiplication units (520-1 to 520-M) used to

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multiply the outputs of the segment latches by a chip of a stored correlation sequence ( $C_i$ ), and their respective summation block (530-2, 530-1) represents a one of a plurality of sliding correlators. Sourour discloses magnitude (absolute value) squared blocks rather than pure absolute value blocks. However, as understood by one having ordinary skill in the art, the magnitude squared blocks (540-1, 540-2) perform at least the function of the claimed absolute value blocks because they always convert either positive or negative inputs into their respective *magnitude* or absolute value only before such values are squared. Regarding claim 2, Sourour discloses the limitations of claim 1 as applied above. Further, Sourour discloses that each of the plurality of sliding correlators receives a portion of a stored correlation sequence (fig. 5, " $C_i$ "; col. 7, lines 2-5) for comparison to the portion of the received correlation sequence.

Regarding claim 3, Sourour discloses the limitations of claim 1 as applied above. Further, Sourour discloses that the correlation output corresponds to a correlation peak (col. 3, lines 60-65).

Regarding claim 6, Sourour discloses the limitations of claim 1 as applied above. Further, Sourour discloses that the apparatus comprises a portion of a code division multiple access receiver (col. 8, lines 35-40).

Regarding claim 16, Sourour discloses the limitations of the claim as applied to claim 1 above.

Regarding claim 17, Sourour discloses the limitations of the claim as applied to claim 3 above.

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Regarding claim 20, Sourour discloses the limitations of the claim as applied to claim 20 above. The steps in the method are performed sequentially in the stated order as illustrated by Sourour.

8. Claims 4, 5, 7, 8, 18 and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bolorian (US 6950458; hereafter "Bolorian") in view of Sourour.

Regarding claim 4, Bolorian discloses a base station transmitter that transmits a synchronization control channel (SCH) which is comprised of a primary SCH and a secondary SCH (col. 4, lines 10-16). Bolorian discloses that, in an ordinary Wideband Code Division Multiple Access (WCDMA) receiver based on the Universal Mobile Telecommunications Standard (UMTS), the SCH channels are correlated to find a peak which represents the base station the receiver should communicate with (col. 4, lines 40-45). Bolorian does not disclose the limitations of claim 1. However, Sourour does disclose an exemplary method to perform synchronization using correlation as applied to claim 1 above. Further, Sourour teaches that the disclosed apparatus is advantageously used to reduce errors arising from mismatches between the frequencies of the received and locally generated sequences (col. 7, lines 25-30). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize a correlation apparatus as taught by Sourour as a correlator for the SCH channels of Bolorian because, in the case of a frequency mismatch, the correlator of Sourour reduces errors.

Regarding claim 5, the limitations of the claim are disclosed by Bolorian in view of Sourour as applied to claim 4 above.

Regarding claim 7, the limitations of the claim are disclosed by Boloorian in view of Sourour as applied to claim 4 above.

Regarding claim 8, the limitations of claim 1 are disclosed by Boloorian in view of Sourour as applied to claim 4 above. Further, Boloorian discloses that the correlation apparatus comprises at least a portion of a cell search block (col. 4, lines 15-50).

Regarding claim 18, the limitations of the claim are disclosed by Boloorian in view of Sourour as applied to claim 4 above.

Regarding claim 19, the limitations of the claim are disclosed by Boloorian in view of Sourour as applied to claim 4 above.

9. Claims 9-11, 14 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schelm et al (US Pub. No. 2003/0235238; hereafter "Schelm") in view of Sourour.

Regarding claim 9, Schelm discloses a code division multiple access ("CDMA") receiver (para. 0001), comprising: an analog-to-digital converter (fig. 1, ref. 16) that receives a CDMA signal (fig. 1, ref. 15) via an antenna (fig. 1, ref. 14) and converts the CDMA signal into a digital signal (fig. 1, ref. 18); a matched filter (fig. 1, ref. 20) that filters the digital signal to produce a filtered digital signal; a tapped delay line (fig. 8, ref. 120) that receives the filtered digital signal and produces a delayed filtered digital signal (para. 0093); and, a cell search block (fig. 8, ref. 122; "correlator 1-R"). The plurality of correlators of Schelm are considered to be a cell search block because they search for a correlation peak in the received signal from a cellular base station. Schelm does not disclose that each correlator of the cell search block is comprised of a plurality of sliding



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correlators that each receives at least a portion of the delayed filtered digital signal and provides a partial correlation output; an absolute value block that takes the absolute value of each partial correlation output; and circuitry that combines the absolute values of each of the partial correlation outputs to form a correlation output. However, Sourour teaches an exemplary correlator comprised of a plurality of sliding correlators that each receives at least a portion of the delayed filtered digital signal and provides a partial correlation output; an absolute value block that takes the absolute value of each partial correlation output; and circuitry that combines the absolute values of each of the partial correlation outputs to form a correlation output as applied to claim 1 above. Further, Sourour teaches the correlator may be advantageously used to reduce errors arising from mismatches between the frequencies of the received and locally generated sequences. Therefore, it would have been obvious to one having ordinary skill in the art to replace each of the correlators in the cell search block of Schelm with the frequency mismatch correcting correlators of Sourour because they could be used to reduce errors due to frequency mismatch.

Regarding claim 10, Schelm in view of Sourour disclose the limitations of claim 9 as applied above. Further, Sourour discloses that each of the plurality of sliding correlators receives a portion of a stored correlation sequence (fig. 5, "Ci"; col. 7, lines 2-5) for comparison to the portion of the received correlation sequence.

Regarding claim 11, Schelm in view of Sourour disclose the limitations of claim 9 as applied above. Further, Sourour discloses that the correlation output corresponds to a correlation peak (col. 3, lines 60-65).

Regarding claim 14, Schelm in view of Sourour disclose the limitations of claim 9 as applied above. Further, Sourour discloses that the apparatus comprises a portion of a code division multiple access receiver (col. 8, lines 35-40).

Regarding claim 15, Schelm in view of Sourour disclose the limitations of claim 9 as applied above. Further, Sourour discloses that the CMA receiver complies with the UMTS WCDMA standard (para. 0015).

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schelm in view of Sourour, and in further view of Boloorian.

Regarding claim 12, Schelm in view of Sourour disclose the limitations of claim 11 as applied above. Schelm in view of Sourour disclose that the CDMA receiver is a WCDMA receiver (para. 0003), but do not disclose that the correlation peak corresponds to a primary synchronization channel. However, Boloorian teaches that primary and secondary synchronization channels are widely utilized by WCDMA receivers for initial cell search to allow a receiver to lock to a particular transmitting base station (col. 4, lines 10-50). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize the cell search block to find the peak of the primary synchronization channel as taught by Boloorian in the receiver of Schelm in view of Sourour because it would allow for synchronization with the transmitting base station for WCDMA communications.

Regarding claim 13, Schelm in view of Sourour, and in further view of Boloorian disclose the limitations of the claim as applied to claim 12 above.


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**Conclusion**

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Jason M. Perilla  
December 7, 2006

jmp

  
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SUPERVISORY PATENT EXAMINER